F·A·A·M facility for airborne atmospheric measurements

FLIGHT FOLDER

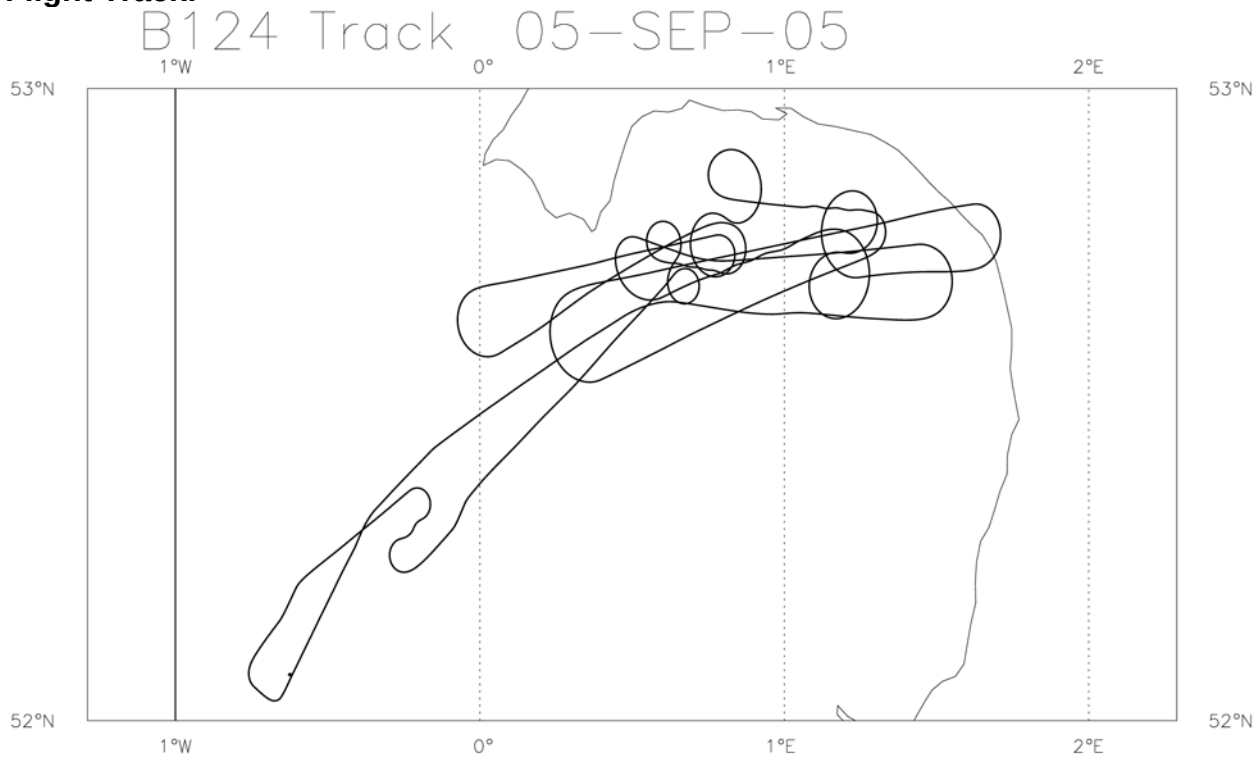
Flight No.:	B124
Date:	05 Sep 2005
Take Off	13:45:20
Landing:	15:52:55
Flight Time	2h07m35

Campaign: LTI Alignment Tests

Operating Area: East Anglia

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Jackie Mulholland	Directflight
4	Mission Scientist	Jamie Trembath	FAAM
5	Flight Manager	Maureen Smith	FAAM
6	CCN / CCM2	Stuart Heath	FAAM
7	LTI 1	Bernie Lafleur	University of Denver / Manchester University
8	LTI 2	Jonny Crosier	Manchester University
9	LTI 3	Gerrard Capes	Manchester University
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

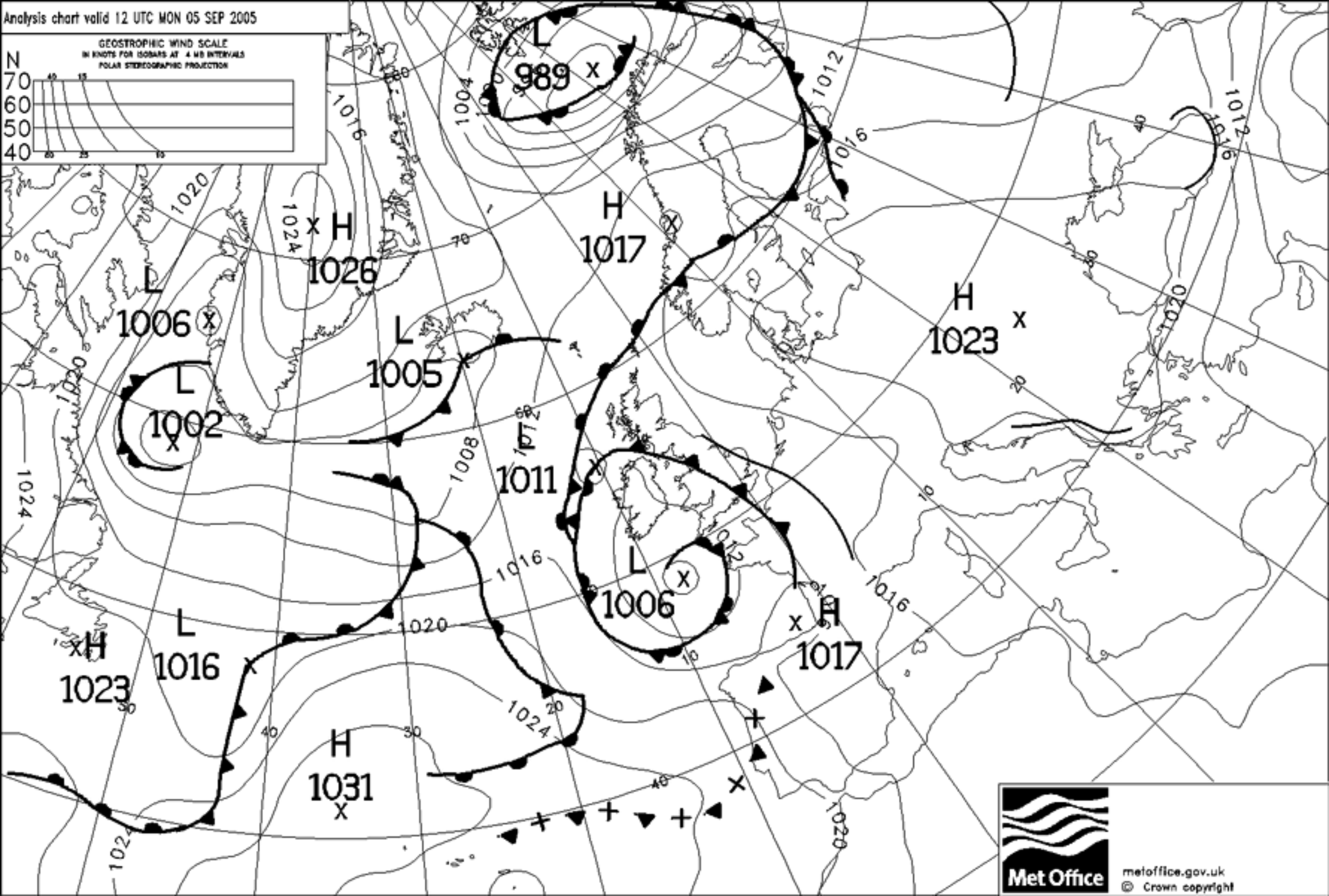
Flight Track:



FLIGHT SUMMARY

Flight No B124
Date: 05/09/05
Project: LTI Alignment Tests
Location: East Anglia

Start Time	End Time	Event	Height (s)	Hdg	Comments
125007		Start posn	0.36 kft	124	52'04.36N, 0'37.48W
132612		INU	0.36 kft	124	Set to Navigate
134520		T/O	2.3 kft	292	Cranfield
135344		Videos	5.0 kft	059	Start FFC & DFC
135827	140037	Run 1	1.7 - 1.6 kft	059	1.5k',200KIAS
135913		QNH	1.6 kft	049	1008mB
140549	140636	Run 2.1	10.0 kft	051	180-200KIAS
140636	140836	Run 2.2	10.0 kft	053	200KIAS
140848	141140	Right turn	10.0 kft	059	
141155	141435	Left Turn	10.0 kft	031	
141443		Left Yaw	10.0 kft	099	
141455		Right Yaw	10.0 kft	099	
141505		Left Yaw	10.0 kft	110	
141522		Right Yaw	10.0 kft	094	
141538		Left Yaw	10.0 kft	107	
141554		Right Yaw	10.0 kft	093	
141851	142351	Run 2.3	10.0 kft	247	200-300KIAS
142935	143037	Run 3.1	20.0 kft	088	182-200KIAS
143045	143238	Run 3.2	20.0 kft	089	200KIAS
143244	143628	Right Turn	20.0 kft	088	
143636	144047	Left Turn	20.0 kft	126	
144233		Left Yaw	20.0 kft	101	
144246		Right Yaw	20.0 kft	090	
144304		Left Yaw	20.1 kft	107	
144320		Right Yaw	19.9 kft	098	
144339		Left Yaw	20.1 kft	109	
144400		Right Yaw	19.9 kft	091	
144616	145121	Run 3.3	20.0 kft	244	200-300KIAS
150125	150324	Run 4.1	29.9 - 30.0 kft	086	180-200KIAS
150258		Videos	30.0 kft	087	Change tapes
150548	150750	Run 4.2	30.0 kft	261	200KIAS
150800	151200	Right Turn	30.0 kft	262	
151229	151655	Left Turn	30.0 kft	243	
151707		Left Yaw	30.1 kft	244	
151727		Right Yaw	30.1 kft	238	
151741		Left Yaw	30.1 kft	250	
151807		Right Yaw	29.9 kft	241	
151824		Left Yaw	30.1 kft	252	
151851		Right Yaw	30.0 kft	240	
152251	152749	Run 4.3	30.0 kft	111	200-248KIAS
153143	154659	Profile 1	20.0 - 2.6 kft	266	1000fpm
153551		Event	15.5 kft	270	Through cloud
155255		Land	0.38 kft	210	Cranfield
155711		Stop posn	0.38 kft	307	52'04.36N, 0'37.48W
155746		Videos	0.38 kft	307	Stop tapes


Analysis chart valid 12 UTC MON 05 SEP 2005
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L 989
H 1017
H 1026
L 1006
L 1005
L 1002
H 1023
L 1011
L 1006
H 1017
H 1023
L 1016
H 1031
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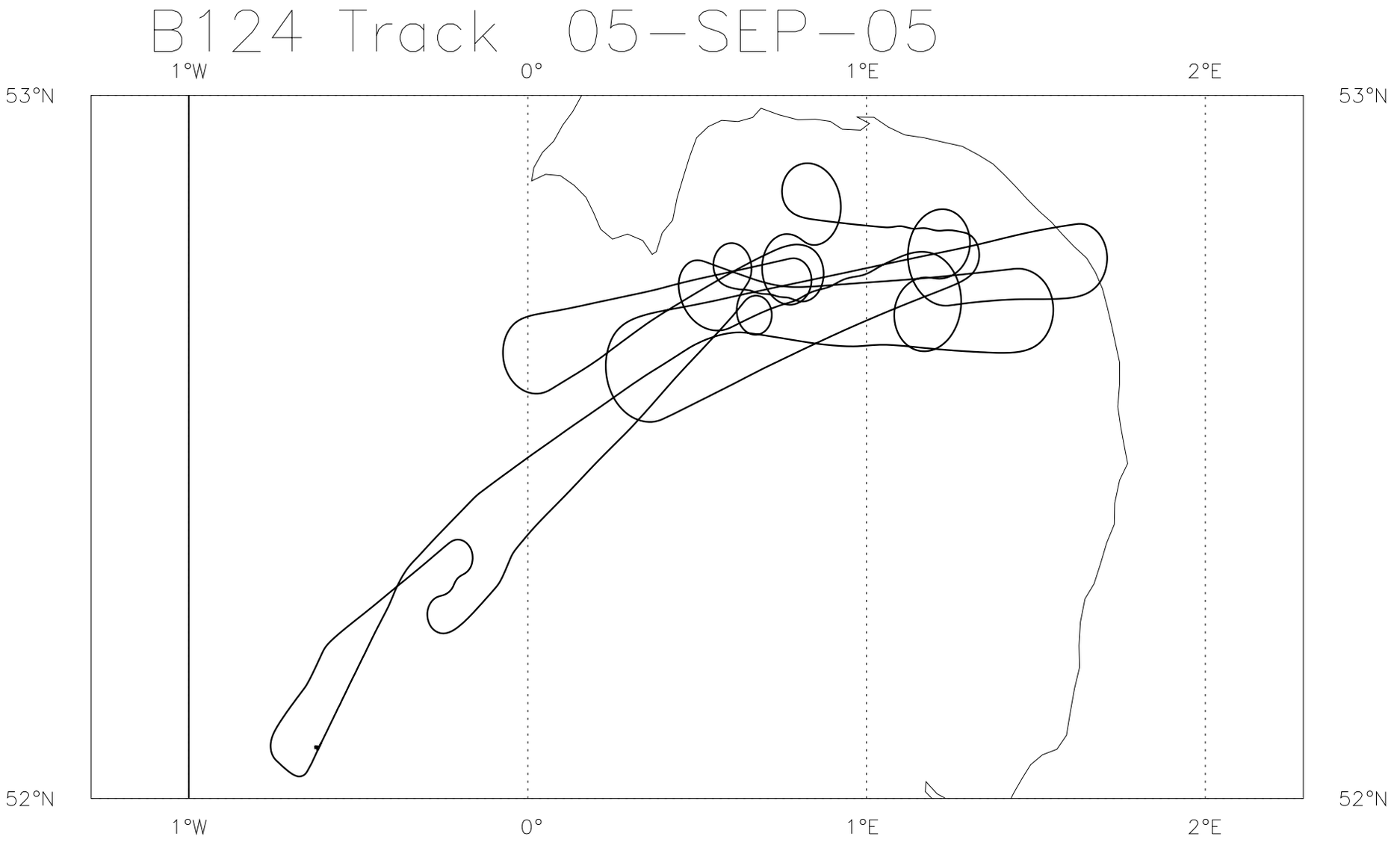
B124 Track 05-SEP-05
1°W
0°
1°E
2°E
53°N
52°N

Sortie Title: LTI Primary Alignment Tests

Aims

The aims of this initial test are to establish whether or not the LTI strut is aligned relative to the angle of attack of the aircraft. The aircraft will fly patterns and manoeuvres encountered during normal scientific missions (profiles, SLR, turns) to determine how the LTI functions during these flights. The aircraft will also vary the angle of attack by constant deceleration from max speed at a fixed height.

Key Measurement

To proceed with this test, the LTI inlet cone has been replaced with a 5 hole wind vector probe. This will determine if the LTI is aligned relative to the local field streams and if it is suitable for scientific operation. To interpret the data, TAS, angle of side slip and angle of attack must be recorded.

Weather Conditions

The only requirement is for cloud free conditions.

Sortie details

Item 1: Take off and transit to a suitable area chosen by the pilots.
Item 2: Profile ascent to ceiling at 1000 ft/min above 5000 ft, 500 ft/min below 5000 ft
Item 3: Interrupt ascent at FL200 for SLR for 2 mins
Item 4: Resume profile ascent
Item 5: SLR at ceiling for 2 mins
Item 6: Profile descent to FL1 at 1000 ft/min above 5000ft and 500 ft/min below 5000 ft.
Item 7: interrupt profile descent at FL100, FL10 for SLR of 2 mins each.
Item 8: SLR at FL1 for 2 mins.

Ascend to suitable height for safe turns.

Item 9: Standard bank to port, 360 degrees
Item 10: Standard bank to starboard, 360 degrees
Item 11: Several yaw manoeuvres, port and starboard, maximum possible range
Item 11: At a height above 8000 ft, accelerate to max speed and then decelerate at a constant rate to min speed over a time period 10-15 mins at a fixed flight level.

Item 12: Return to Cranfield.

Items 2 to 10 to be done at normal science speed.

Quick look data: TAS, angle of attack, angle of side slip, static temperature, static pressure, Mach number

Mission Scientist's Debrief

Flight No : B 124 **Date :** ~~08/05~~ 05.09.05

1. Assessment of the flight

ROSEMONT 858 WIND VECTOR PROBE ON UM LTI STRUT

The flight was very successful. All the desired aircraft maneuvers were performed as requested. A preliminary look at the data shows that the maneuvers did register on our transducers in the way we expected.

The data has some unexplained noise in all the channels. We believe that the noise was generated inside our system, not from an interaction between our system and the aircraft or other instrument(s) aboard the aircraft. Further investigation is required to determine the source of this noise. We believe that removing the noise the noise from the data will be a simple task and should not have any (or only very little) influence on the final data quality.

2. Summary of the weather conditions

Flight Manager's Instrument Status Log

Flight No. **B**124 Date: 05/09/05

Instrument	Fitted	Operated	Instrument	Fitted	Operated
Navigation			**Cloud Physics**		
INU		**Y**	**Probes**		
XR5M GPS		**Y**	FFSSP		**N**
Cruciform GPS	**Y**	**N**	PCASP		**N**
Satcom C		**Y**	2D-P		**N**
Satcom H		**Y**	2D-C		N
Thermometers			Cloudscope	**N**	**N**
De-Iced Temp		**Y**	SID 1	**Y**	**N**
Non De-Iced		**Y**	SID 2	**Y**	**N**
Heimann	**N**		HVPS	**N**	**N**
Hygrometers			CIP25	**Y**	**N**
G. Eastern		**Y**	CIP100	**Y**	**N**
J. Williams		**Y**			
Nevzorov		**Y**			
TWC	**N**				
FWVS	**N**	**N**	**Racks:**		
Radiometers			INC	**N**	**N**
Upper Clear	**Y**	**Y**	CCN / CNC		**Y**
" Red	**Y**	**Y**	CVI	**Y**	**N**
" Silicon	**Y**	**Y**			
" JO1D	**Y**	**Y**	**Aerosol**		
Lower Clear	**Y**	**Y**	PSAP	**Y**	**N**
" Red	**Y**	**Y**	Nephelometer	**N**	
" Silicon	**Y**	**Y**	Filters	**Y**	**N**
" JO1D	**Y**	**Y**	AMS	**Y**	**N**
Large Radiometers					
TAFTS	**N**				
MARSS	**N**				
DEIMOS	**N**		**Others:**		
ARIES	**N**		NIR TDLAS	N	N
SWS	N		2BT O3	Y	N
Chemistry			VACC	Y	N
Ozone	Y	N	PEROXIDE	Y	N
SO2	Y	N	Formaldehyde	Y	N
NOX	Y	N	ADA	Y	N
CO	Y	N	CPI	Y	N
ORAC	Y	N	NOxy	Y	N
PAN	Y	N	PTRMS	Y	N
PERCA	N	N	Bag Sampling	Y	N
WAS	Y	N	Tube Sampling	Y	N

Faults / Incidents Log

Flight No. B124
Date: 05/09/05

Instruments

1. RFC & DFC – pre-flight, picture had extra date and fixed time displayed at top of screen. Reset Video Titler switch, this cleared it.

2. Upper BBR DLU – had 12 Type 6 messages and 264 counts under "Incmp" on DLU status page.

3. DFC – Large smudge on window. Also, occasional "motion alarm" warning on display.

4. Videos – Tapes only recording for 1 hour. Should go for 90minutes in Standard Play mode.

Aircraft

1. Intercom – We have been asked to go onto Training Net for take-off and landing again. It is not clear to the Flight Manager if everyone remains on that channel for the "ready for power-transfer?" call.

Satcom H Calls - Nil

MISSING LOG SHEETS:

The following logs are not available for flight B124:

Log	Reason
Mission Scientist	No log was taken during this test flight
CCN	The instrument was switched on to test the instrument rather than to record data
LTI	No log has been submitted to FAAM for inclusion in this pdf flight folder

VIDEO RECORDINGS:

Digital8 video recordings from this flight reside with FAAM (at 31 Oct 2005) :

2 x Forward Facing Cameras
2 x Downward Facing Cameras